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CONTEMPORARY METHODS OF TREATMENT FOR PALMOPLANTAR PSORIASIS: A LITERATURE REVIEW

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Алақан-табан псориазын емдеудің заманауи әдістері: әдеби шолу

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Қазіргі әдебиеттерге сәйкес, псориаз – бұл терінің басым зақымдануы бар генетикалық анықталған мультифакторлы созылмалы ауру, оның негізінде гиперпролиферация және эпидермиялық кератиноциттердің ажыратылуының бұзылуы, цитокиндер мен медиаторлардың пайда болуымен терінің иммундық гомеостазының өзгеруі, "төмен" кератиноциттердің көбеюін күшейтеді, сонымен қатар дермистегі қабыну реакциясын тудырады. Соңғы уақытта аурудың патогенезі және биологиялық терапия сияқты заманауи емдеу әдістерінің пайда болуы туралы жаңа дәлелдерге байланысты қатар жүретін аурулар туралы түсінік алу маңызды.

Псориаздың клиникалық формаларының ішінде алақан мен табан псориазы ерекше орын алады. Псориаздың бұл формасы дәстүрлі емдеу тәсілдеріне төзімді екені белгілі. Мақалада алақан мен табан псориазының емі туралы соңғы ақпараттар келтірілді. Алақан-табан псориазын жергілікті, сонымен қатар, жүйелі емдеудің ауқымы қарастырылды.

Псориаздың барлық түрлері, атап айтқанда алақан-табан пустулярлы псориазы пациенттердің өмір сүру сапасын айтарлықтай нашарлатады. Науқастар кәсіби қызметінде, күнделікті өмірінде, әріптестерімен және туыстарымен қарым-қатынасында шектелген. Дерматологиялық өмір сапасының индексі алақан-табан псориазының пациенттердің әлеуметтік белсенділігіне әсер етуінің жоғары дәрежесін көрсетеді. Қазіргі заманғы емдеу әдістері терінің күйін жақсартуға, ремиссия ұзақтығын сақтауға, сол арқылы пациенттердің өмір сүру сапасын жақсартуға арналған.

Псориаз созылмалы қайталанатын дерматоздар арасында жетекші орындардың бірін алады. Дамыған елдерде псориаз халықтың географиялық орналасуына байланысты 1,5-3% -дан 5-7% -ға дейін зардап шегеді.

Псориатикалық процесс созылмалы қайталанатын сипатқа ие. Ремиссия ұзақ мерзімді болуы мүмкін – бірнеше айдан ондаған жылдарға дейін, бірақ кейбір науқастарда ремиссия мүлдем болмайды. Псориазбен өмірдің болжамы көбінесе қолайлы.

Негізгі сөздер: *псориаз, алақан-табан псориазы, фотодинамикалық терапия, бауыр, гормоналды дисбаланс*

Contemporary Methods of Treatment for Palmoplantar Psoriasis: A Literature Review

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According to recent studies, psoriasis is a genetically determined multifactorial chronic disease primarily affecting the skin, characterized by hyperproliferation and impaired differentiation of epidermal keratinocytes, as well as changes in immune homeostasis leading to the formation of cytokines and mediators. These mediators enhance the proliferation of abnormal keratinocytes and induce an inflammatory response in the dermis. Recently, due to new insights into the pathogenesis of the disease and the emergence of advanced treatments, such as biological therapy, it has become important to understand concomitant diseases.

Palmoplantar psoriasis holds a special place among all known clinical forms of psoriasis. It is known that this form of psoriasis is resistant to conventional treatments. This study provides current information on the treatment of palmoplantar psoriasis, considering both local and systemic treatment options. Modern methods and current recommendations for the treatment of psoriasis are discussed. All forms of psoriasis, including palmoplantar pustular psoriasis, significantly worsen patients' quality of life. Patients are often limited in their professional activities, daily life, and relationships with colleagues and relatives. The "Dermatological Quality of Life Index" indicates a high degree of impact of palmoplantar psoriasis on patients' social activity. Modern treatments aim to improve skin condition, prolong remission, and thereby enhance patients' quality of life.

Psoriasis is one of the leading chronic recurrent dermatoses. In developed countries, psoriasis affects 1.5-3% to 5-7% of the population, depending on geographical location. The psoriatic process has a chronic, relapsing nature. Remissions can be long, lasting from several months to decades, but in some patients, remission does not occur at all. The prognosis for life with psoriasis is most often favorable.

Keywords: *psoriasis, palmoplantar psoriasis, photodynamic therapy, liver, hormonal imbalance*

Современные методы лечения ладонно-подошвенного псориаза: обзор литературы

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По данным современной литературы псориаз – это генетически детерминированное мультифакторное хроническое заболевание с преимущественным поражением кожи, в основе которого лежит гиперпролиферация и нарушение дифференцировки эпидермальных кератиноцитов, изменение иммунного гомеостаза кожи с образованием цитокинов и медиаторов, усиливающих пролиферацию «неполноценных» кератиноцитов, а также индуцирующих воспалительную реакцию в дерме. В последнее время в связи с новыми данными о патогенезе заболевания и появлением современных методов лечения, таких как биологическая терапия, важно иметь представление о сопутствующих заболеваниях.

Среди всех выделяемых клинических форм псориаза особое место занимает ладонно-подошвенный. Известно, что эта форма псориаза отличается резистентностью к традиционным методам лечения. В статье приведены современные сведения о лечении ладонно-подошвенной формы псориаза. Рассмотрен спектр средств лечения ладонно-подошвенного псориаза, как местных, так и системных. Обсуждены современные методы и текущие версии рекомендации по лечению псориаза.

Все формы псориаза, а именно ладонно-подошвенный пустулезный псориаз, значительно ухудшают качество жизни пациентов. Пациенты ограничены в профессиональной деятельности, быте, отношениях с коллегами и родственниками. Показатель «Дерматологического индекса качества жизни» демонстрирует высокую степень влияния ладонно-подошвенного псориаза на социальную активность пациентов. Современные методы лечения предназначены для улучшения состояния кожи, сохранения длительности ремиссии, тем самым улучшения качества жизни пациентов.

Псориаз занимает одно из ведущих мест среди хронических рецидивирующих дерматозов. В развитых странах псориазом страдает от 1,5-3% до 5-7% населения в зависимости от географического положения популяции.

Псориатический процесс носит хронический рецидивирующий характер

течения. Ремиссия может быть длительной – от нескольких месяцев до десятков лет, однако у ряда пациентов ремиссия вообще не наступает. Прогноз для жизни при псориазе чаще всего благоприятный.
Ключевые слова: *псориаз, ладонно-подошвенный псориаз, фотодинамическая терапия, печень, гормональный дисбаланс*

Psoriasis is a chronic, systemic, immune-mediated disease of multifactorial origin with a dominant role of genetic factors. It is characterized by hyperproliferation and impaired differentiation of epidermal cells, as well as an imbalance between proinflammatory and anti-inflammatory cytokines [1]. Psoriasis affects 2-3% of the population, with prevalence varying by region. Residents of the Caucasus and Scandinavia are most susceptible to the disease [2].

The vast majority (85-90%) of psoriasis cases manifest clinically as plaque psoriasis, which presents as erythematous, asymmetric plaques with thick scales, most commonly found on the extensor surfaces, trunk, and scalp. While plaque psoriasis is the most common subtype, other subtypes include erythrodermic, pustular, guttate, inverse, and palmoplantar psoriasis [3]. Psoriatic lesions, especially on sun-exposed areas, can be accompanied by pruritus and have a major impact on the quality of life, often leading to social withdrawal and psychological issues such as feelings of inferiority, depression, and anxiety.

The concept of psoriasis as a systemic disease caused by a cascade of inflammatory reactions necessitates systemic treatment [4]. However, current treatments for moderate to severe psoriasis can have many side effects when used over long periods .

The severity of psoriasis is determined not only by the extent of body surface area affected (Body Surface Area, BSA; with BSA <5% considered mild, BSA = 5-10% moderate, and BSA ≥10% severe) but also by the localization of the pathological process. Localizations of concern, such as involvement of exposed skin areas, extensive scalp involvement, and damage to the genitals, palms, soles, and nail plates, can significantly impact the patient's quality of life [5].

Palmoplantar psoriasis, often diagnosed in individuals aged 30 to 50 years engaged in physical labor, primarily affects the plantar surfaces of the feet and the palms [6]. This form of psoriasis is frequently resistant to therapy and can present in several subtypes:

1. Barber's Pustular Psoriasis: This subtype is limited to lesions on the palms and soles. Its development can be triggered by infections, stress, use of antimalarial drugs, β-blockers, lithium, phenylbutazone, antibiotics, hormonal imbalances, abrupt discontinuation of corticosteroids, and inappropriate external therapy. Staphylococcal infection, impaired T-cell immunity, and liver dysfunction may also contribute. Hormonal imbalance is a significant factor, as evidenced by cases of generalized pustular psoriasis following corticosteroid treatment or withdrawal, large doses of progesterone, or diabetes mellitus. Generalized pustular psoriasis commonly develops between ages 40-60, typically 1-2 years after the onset of common psoriasis, although it can appear 7-10 years later depending on the intensity and duration of adverse factors [7].

2. Vulgar Psoriasis: This type features isolated lesions on the palms and soles, presenting with various elements. Some cases show small, rounded plaques with a vivid red color, either depressed or elevated, and covered with dense, yellow, difficult-to-remove scales. Other cases display diffuse rashes with peripheral growth, resulting in a bumpy surface with extensive "calloused" deposits and painful cracks of a dirty gray color [8]. Although palmoplantar psoriasis usually covers less than 5% of BSA, it causes significant discomfort and decreased quality of life, warranting systemic therapy. Methotrexate, cyclosporine, and systemic retinoids are effective treatments in most cases [9].

In accordance with the pathogenetic processes of psoriasis, therapy should focus on reducing inflammation, suppressing epithelial cell proliferation, and normalizing their differentiation. Numerous drugs and methods for treating psoriasis have been developed to date. When prescribing treatment, it is essential to consider factors such as the extent of skin lesions, disease stage, patient age, gender, concomitant diseases, and any contraindications to specific treatments or medications [10].

For psoriasis predominantly affecting the palms and soles, topical treatments are commonly employed, including corticosteroids, synthetic analogues of vitamin D3 metabolites, and retinoids. Systemic retinoids, particularly acitretin, are used, and in some cases, especially when accompanied by psoriatic arthritis, immunosuppressive agents such as cyclosporine A and methotrexate may be utilized [11]. However, external therapies often prove insufficient, and systemic treatments can lead to side effects and limitations, particularly in patients with concomitant conditions. Consequently, the search for and development of new, effective, and safe therapeutic methods for psoriasis affecting the palms and soles remain pertinent [12].

Phototherapy has become a widely adopted treatment modality for this condition. Commonly used methods include PUVA (psoralen and ultraviolet A) therapy, narrow-band UVB therapy (311 nm), and UVA1 (ultraviolet A1) therapy (340-400 nm). Narrow-band UVB therapy, introduced in the 1980s, was developed following research by J.A. Parrish, who identified that the optimal radiation range for psoriasis is 296–313 nm, with 310–313 nm offering the best safety profile. Narrow-band UVB (311 nm) is noted for its immunoregulatory effects [13], reducing proinflammatory cytokines such as IL-2, IL-6, and IL-23. IL-6 and IL-23 activate STAT3, which increases the expression of transcription factors RORγt and RORγ, subsequently enhancing the expression of key Th-17 cytokines (IL-17A, IL-17F, IL-21, and IL-22) [14].

UVB 311 nm radiation can induce apoptosis, likely by reducing the expression of survivin, a protein that inhibits apoptosis by suppressing the activation of caspase-3. This method also inhibits keratinocyte proliferation by increasing the epidermal expression of GATA3 (GATA Binding Protein 3). In the skin, GATA3 is essential for the proper formation of the epidermal barrier and regulation of epidermal differentiation through the activation of kallikrein-1 [15].

A pressing issue is childhood psoriasis, which is showing a marked increase in incidence. Palmar-plantar psoriasis in children occurs in about 25% of all clinical forms, causing significant discomfort and reduced quality of life. This form of psoriasis often presents with a persistent course and resistance to conventional treatments [16].

Scientific studies indicate that UVB 311 nm wavelengths offer the maximum therapeutic effect with minimal erythema and reduced carcinogenic risk compared to other types of UV therapy. Fewer treatments are needed to achieve results, leading to longer remissions and fewer side effects. Additionally, UVB therapy can be combined with other treatments and helps restore immunological reactivity, enhance the body's adaptive and compensatory capabilities, and improve blood circulation and metabolism in the skin. These benefits make UVB phototherapy a preferred option, particularly in pediatric practice.

Local application of UVB 311 nm therapy combined with topical calcipotriol is highly effective for treating children with palmoplantar psoriasis. This approach achieves clinical remission and significant improvement in the majority of patients (96%). Additionally, using pulsed UVB 311 nm therapy after the primary treatment allows for disease management and monitoring in 83.3% of patients for up to one year [17].

An excimer lamp emitting at 308 nm is also recommended for treating both palmoplantar and generalized forms of psoriasis, either as monotherapy or as part of a comprehensive treatment regimen. The duration of exposure should be individualized based on the patient's skin sensitivity to radiation [18].

In 2017, research focused on the use of photodynamic therapy (PDT) for patients with psoriasis, particularly those with significant comorbidities. Notably, PDT has shown remarkable efficacy in treating palmoplantar psoriasis, which often has a persistent course and limited response to methotrexate, significantly affecting patients' quality of life and psychological well-being. The outcomes of PDT are comparable to those of 10-15 sessions of PUVA (psoralen and ultraviolet A) therapy or 4 rounds of methotrexate. For patients who cannot tolerate these therapies, PDT offers a valuable alternative as part of the core treatment strategy [19].

The study results indicate that incorporating photodynamic therapy (PDT) into the standard treatment regimen provides high clinical efficacy for psoriasis. PDT procedures are associated with minimal contraindications and are suitable for treating psoriasis in patients with significant comorbidities as well as those with palmoplantar psoriasis [20].

New-generation biologic drugs, which target key mediators in the inflammatory pathway of psoriasis, offer effective and relatively safe treatment options [21]. In the Russia, tumor necrosis factor (TNF) blockers, such as etanercept and adalimumab, and an interleukin (IL) 12 and 23 blocker, ustekinumab, are approved for treating psoriasis in children. Research has demonstrated the high clinical efficacy of ustekinumab, with a relatively low incidence of adverse events [22].

Additionally, retinoid medications have shown efficacy in treating palmoplantar psoriasis in children [23]. Clinical diagnostic studies highlight the effectiveness of netakimab as a monotherapy for severe forms of psoriasis. Netakimab is well-tolerated, with no adverse reactions or side effects typically associated with biologic drugs, such as upper respiratory infections or cardiovascular complications. Treatment with netakimab resulted in reductions in PASI (Psoriasis Area Severity Index), DAS28 (Disease Activity Score-28), and BASDAI (Bath Ankylosing Spondylitis Disease Activity Index). Consequently, netakimab effectively controls the disease, significantly improves patients' quality of life, and is suitable for monotherapy in severe psoriasis cases [24].

Another immunosuppressive treatment for psoriasis involves the use of sodium salt of the synthetic dipeptide gamma-D-glutamyl D-tryptophan. This compound selectively suppresses the functional activity of immunocompetent cells and inhibits autoimmune processes, while sparing cells of other organs and tissues, and it is associated with virtually no side effects [25].

Therapy with gamma-glutamyl-tryptophan has demonstrated a pronounced clinical effect, significantly delaying the onset of relapses and substantially extending the duration of clinical remission compared to other antipsoriatic therapies.

Secukinumab, approved in Russia in 2016, is indicated for the treatment of moderate to severe psoriasis in adult patients who are candidates for systemic therapy or phototherapy. Secukinumab is a fully human monoclonal antibody targeting interleukin-17A (IL-17A), a key cytokine in the inflammatory process of psoriasis [26].

Extensive clinical research, including numerous large-scale direct comparative trials (Phase II and Phase III), has been conducted to evaluate the safety, efficacy, and impact of secukinumab on the quality of life in patients with psoriasis. These studies, involving over 4,500 patients, have assessed its effectiveness in cases resistant to standard treatments or with challenging localizations, such as palmoplantar psoriasis, scalp psoriasis, psoriatic onychodystrophy, and psoriatic arthritis [27].

IL-17 inhibitors, especially brodalumab and ixekizumab, are known for their rapid onset of efficacy. Both IL-17 and IL-23 inhibitors, including brodalumab, ixekizumab, and risankizumab, have demonstrated high long-term efficacy and acceptable safety records in clinical studies [28]. However, some safety concerns have been identified. TNF-α inhibitors are associated with a

slightly increased risk of serious infections, tuberculosis, paradoxical reactions, lupus, and infusion reactions (specifically with infliximab). IL-17 inhibitors are linked to candidiasis, neutropenia, and inflammatory bowel disease, whereas no specific adverse events have been reported for IL-23 inhibitors thus far [29]. General safety concerns for biologics include the risk of hepatitis B virus reactivation and interstitial pneumonia, particularly with TNF-α inhibitors. There is insufficient evidence regarding the long-term safety of newer agents like IL-17 and IL-23 inhibitors [30].

Systemic corticosteroids, although not part of current psoriasis treatment protocols, are still used in clinical practice [31]. However, they are not suitable for long-term use due to their serious side effects. Methotrexate (MTX) acts by inhibiting keratinocyte proliferation. After oral administration, peak blood concentrations are reached within 1-2 hours, with bioavailability ranging from 25% to 70%. When administered subcutaneously or intramuscularly, peak concentrations are achieved within 30-60 minutes. MTX is minimally metabolized by the liver and is excreted unchanged by the kidneys. In low doses, MTX has a noticeable immunosuppressive effect without pronounced hemolytic activity, making it suitable for long-term treatment of chronic diseases such as psoriasis, rheumatoid arthritis, and Crohn's disease.

In cases of psoriasis exacerbation, topical therapy should commence with stronger corticosteroids and then transition to medium-strength drugs. Clobetasol and mometasone are suitable for this approach. IL-12/23, IL-17 antagonists, and new IL-23p19 antagonists represent a revolutionary breakthrough in psoriasis treatment. Several studies have summarized data on the efficacy and safety of IL-17 and IL-23 drugs [32]. The choice of therapeutic measures for psoriasis primarily depends on the severity of the condition. Patients with moderate to severe disease require systemic immunosuppressive therapy. Methotrexate, synthetic retinoids, and cyclosporine are commonly used but can be associated with organ toxicity and side effects, necessitating clinical and laboratory monitoring throughout treatment.

In recent years, genetically engineered drugs—monoclonal antibodies (MABs)—have been widely used to treat psoriasis. MABs are highly effective due to their anticytokine activity, targeting specific pathways in the pathological process, which significantly improves patients' quality of life and achieves prolonged remission. Vitamin A analogues are primarily prescribed for severe and rare forms of psoriasis. These drugs have anti-inflammatory properties that reduce skin cell proliferation, but their use is associated with severe adverse effects, including liver damage and teratogenicity [33].

A topical combination drug containing calcipotriol and betamethasone is the preferred choice for external treatment of various clinical forms of psoriasis. Studies have confirmed that both the ointment and gel forms of this drug are effective, promoting rapid resolution of clinical manifestations and improving the quality of life. The combination of calcipotriol and betamethasone can be used to manage exacerbations and maintain long-term control over the disease. The drug's favorable organoleptic properties, combined with its high efficacy and good tolerability, ensure high patient compliance [34].

Studies have also indicated the high efficacy of various combination therapies, particularly when combined with ultraviolet therapy. These methods work through mutual potentiation and summation of each component's effects. Developing combined pharmaco-physiotherapeutic methods, including the use of ultraviolet radiation and low doses of immunosuppressive drugs, holds promise for treating certain dermatoses. In psoriasis, methotrexate, a first-line treatment for moderate psoriasis, is promising; however, increased photosensitivity limits its use with ultraviolet therapy, especially in patients with comorbidities. Combined ultraviolet therapy with emission at 311 nm and 320-400 nm (UVB/UVA) is theoretically suitable for psoriasis.

The combined method of treating psoriasis has a high safety profile, as evidenced by the absence of clinically significant adverse events, such as thrombocytopenia and leukopenia, and stable liver transaminases and creatinine levels. This enhances patient compliance. The high therapeutic and prophylactic efficacy and safety of the combined method make it a recommended approach for widespread use in dermatovenerology practice.

New biological agents such as risankizumab, guselkumab, ixekizumab, and brodalumab have demonstrated high efficacy in patients with moderate to severe psoriasis [35]. The physiological features of the skin in the palmar-plantar zone, particularly the thickness of the stratum corneum, allow the use of medium and strong topical corticosteroids. Mometasone furoate 0.1% ointment, and mometasone furoate 0.1% with salicylic acid 5%, are preferred due to their high therapeutic activity combined with safety (low resorption coefficient). The treatment regimen for palmar-plantar psoriasis is determined by its clinical form. Re-PUVA therapy (psoralen and ultraviolet A) is recommended for palmar-plantar pustular psoriasis, with acitretin taken orally in parallel with long-wave ultraviolet irradiation (PUVA therapy, PUVA baths). PUVA therapy, whether as monotherapy or combined with systemic retinoids, is effective but slow to show results. PUVA baths, PUVA therapy with photosensitizers on an oil or gel basis, and local SPT (spectral phototherapy) also have favorable effects [36].

Other methods in the treatment of psoriasis involve non-drug therapies, including stress reduction, spa treatments, a healthy lifestyle, and diet. While psoriasis can be well-managed to control its course and relieve symptoms, its multifactorial genesis prevents a complete cure. Patients can temporarily achieve clear skin, but since psoriasis is recurrent, plaques can reappear, especially under stress [37].

Recent data on the pathogenesis of psoriasis have led to its classification as a long-term chronic disease characterized by systemic inflammation. Patients with moderate to severe psoriasis require screening for

concomitant pathologies and systemic therapy. For mild to moderate psoriasis, local therapy is generally sufficient to alleviate the primary symptoms of the disease.

The literature describes isolated cases of spontaneous regression of palmar-plantar psoriasis lesions. There is evidence of positive outcomes from long-term use (4 years) of calcipotriol. One case reported regression of lesions after a 9-month course of external therapy with 5-fluorouracil, with no relapses during a subsequent 4-year observation period. However, in most cases, foreign studies have found several external therapy agents to be ineffective. These include glucocorticosteroids, glucocorticosteroids combined with retinoids, calcipotriol, 10% urea, vitamin A, tacrolimus, salicylic acid, 0.05% isotretinoin, ketoconazole, imiquimod, antibiotics, and colloidal dressings [38].

Contemprory liposomal technologies have enabled the creation of a unique base that effectively replenishes lipid deficiency and restores the protective function of the epidermis. For vulgar psoriasis of smooth skin, it is advisable to use a cream formulated for dry and sensitive skin of the face and body. For palmar-plantar psoriasis, a specialized hand cream is recommended, and for scalp lesions, a balm for dry scalp is appropriate.

Basic external therapies for chronic squamous-hyperkeratotic conditions of the palms and soles, characterized by pronounced dryness, peeling, and skin cracking, include emollients (from the French molle – soft). In contemporary dermatological practice, emollients are recognized as highly effective and essential for managing patients with dry skin prone to hyperkeratosis and desquamation. These agents have the capability to moisturize, soften, and replenish the skin with lipid components, thereby restoring its aesthetic appearance [39]. They reduce transepidermal water loss and replenish intercorneocyte lipid layers.

The therapeutic action of emollients is partly attributed to their ability to fill gaps between exfoliating keratinocytes. However, their primary therapeutic benefit is the enhancement of water content in the stratum corneum. Restoring hydration positively impacts not only the mechanical properties of the stratum corneum, improving skin extensibility and flexibility, but also actively supports the normalization of desquamation processes. Increased concentrations of free water molecules in the skin elevate proteolytic enzyme activity and expedite the breakdown of corneodesmosomes, resulting in more complete and uniform separation of horny scales from the skin surface [40].

Incorporating emollients into comprehensive dermatological treatment regimens boosts the effectiveness of therapy, reduces treatment duration, prolongs remission periods, and improves the overall prognosis of the disease, thereby enhancing the patient's quality of life [41].

In therapeutic and preventive measures, ensuring adequate provision of energy, macronutrients, and micronutrients through an optimal diet is crucial [42]. Rational dietary therapy, which involves consuming diets balanced in essential nutrients and biologically active substances, combined with lifestyle modifications, can significantly enhance the patient's quality of life, correct metabolic disorders, and improve the condition of affected organs and systems, thereby positively influencing the progression of the skin condition [43].

Neglecting the completeness and balance of dietary nutrition, along with the patient's lifestyle, can diminish the effectiveness of therapeutic interventions. This oversight may lead to the exacerbation of alimentary-dependent pathologies, complicate existing conditions, prolong rehabilitation periods, increase the risk of complications, and heighten the frequency of adverse effects from drug therapies [44]. Despite its importance, the role of diet therapy in managing skin diseases, including psoriasis, remains underexplored. Additionally, certain lifestyle factors—such as alcohol consumption and smoking—significantly contribute to the development and progression of psoriasis, affecting its clinical course.

Conclusion

The treatment of palmoplantar psoriasis presents a significant challenge due to its refractory nature, which results from pronounced pathological changes in the epidermis and dermis, as well as continuous trauma and irritation of the skin on the hands and feet. The therapeutic approach involves a range of systemic and external treatments available to clinicians. Currently, various biological agents are employed in managing psoriasis, each differing in terms of onset of action, long-term effectiveness, safety profile, and effects on concomitant diseases. A thorough understanding of these attributes enables the selection of the most appropriate therapy, enhancing treatment outcomes and patient satisfaction by minimizing the disease's impact on daily life.

References:

1. Клинические протоколы диагностики и лечения МЗ РК. Псориаз. 2022. https://diseases.medelement.com/disease/%D0%BF%D1%81%D0%BE%D1%80%D0%B8%D0%B0%D0%B7-%D0%BA%D1%80-%D1%80%D0%BA-2022/17436.
2. Матушевская ЕВ, Коновалова МВ, Владимирова ЕВ, Свирщевская ЕВ. Патогенез и терапия псориаза и псориатического артрита. *Клиническая дерматология и венерология.* 2019;18(5):634-643. doi: 10.17116/klinderma201918051634.
3. Гуреева МА, Молочков АВ, Баграмова ГЭ, Сипкин МС, Карзанов ОВ. Эффективность узкополосной фототерапии в лечении различных форм псориаза с преимущественным пораже-

References:

1. Klinicheskie protokoly diagnostiki i lecheniya MZ RK. Psoriaz. 2022. https://diseases.medelement.com/disease/%D0%BF%D1%81%D0%BE%D1%80%D0%B8%D0%B0%D0%B7-%D0%BA%D1%80-%D1%80%D0%BA-2022/17436. [in Russian]
2. Matushevskaya EV, Konovalova MV, Vladimirova EV, Svirshevskaya EV. Patogenez i terapiya psoriaza i psoriaticheskogo artrita. *Klinicheskaya dermatologiya i venerologiya.* 2019;18(5):634-643. doi: 10.17116/klinderma201918051634. [in Russian]
3. Gureeva MA, Molochkov AV, Bagramova GE, Sipkin MS, Karzanov OV. Effektivnost uzkopolosnoj fototerapii v lechenii razlichnyh form psoriaza s preimushestvennym porazheniem ladonej i podoshv.

нием ладоней и подошв. *Альманах клинической медицины.* 2021;49(8):525-532. doi: 10.18786/2072-0505-2021-49-068.
4. Турбовская СН, Котенко КВ. Локальная узкополосная (311 нм) фототерапия ладонно-подошвенного псориаза у детей. *Физиотерапия, бальнеология и реабилитация.* 2016;15(6):308-310. doi: 10.18821/1681-3456-2016-15-6-308-310.
5. Плиева КТ, Дворянкова ЕВ, Денисова ЕВ, Корсунская ИМ. Фотодинамическая терапия в комплексном лечении больных псориазом. *Клиническая дерматология и венерология.* 2017;16(6): 110-114. doi: 10.17116/klinderma2017166110-114.
6. Мурашкин НН, Амбарчян ЭТ, Епишев РВ, Материкин АИ, Опрятин ЛА, Иванов РА, Куколева ДС, Помазанова МЮ, Купцова ДГ, Козырь ЯВ, Бакулев АЛ. Эффективность и безопасность устекинумаба у детей с бляшечной, эритродермической и ладонноподошвенной формами псориаза: ретроспективное когортное исследование. *Вопросы современной педиатрии.* 2020;19(6):531–537. doi: 10.15690/vsp.v19i6.2153.
7. Буауиш Р. Применение неотигазона у детей в лечении ладонно-подошвенного псориаза. *Bulletin of Medical Internet Conferences.* 2017;7(5):700.
8. Хисматуллина ЗР, Корешкова КМ, Юламанов АС. Опыт применения препарата нетакимаба в лечении больных псориазом и псориатическим артритом. *Клиническая дерматология и венерология.* 2021;20(6):72-80. doi: 10.17116/klinderma20212006172.
9. Кубылинский АА, Короткий НГ, Тихомиров АА, Уджуху ВЮ, Шарова НМ. Оценка эффективности и безопасности применения отечественного селективного иммуносупрессора в терапии больных псориазом. *Клиническая дерматология и венерология.* 2014;5:68-74.
10. Павлова ТГ, Егошина ИГ. Опыт применения секукинумаба у пациента с ладонно-подошвенным псориазом тяжелого течения. *Клиническая дерматология и венерология.* 2018;17(5):128-132. doi: klinderma 201817051128.
11. Матушевская ЕВ, Свиршевская ЕВ, Матушевская ЮИ. Вопросы безопасности и эффективности терапии псориаза. *Клиническая дерматология и венерология.* 2014;2:4-9.
12. Тогоева ЛШ, Миннибаев МТ, Лукьянова ЕН, Корсунская ИМ.. Опыт лечения ладонно-подошвенного псориаза. *Вестник дерматологии и венерологии.* 2011;1:91-95.
13. Сарсур Шади ХР, Руднева НС. Возможности биологической терапии при псориазе. *Вестник СурГУ. Медицина.* 2022;54(4):13-20. doi: 10.34822/2304-9448-2022-4-13-20.
14. Круглова ЛС, Шарапова ЕН, Жукова ОВ, Бабушкин АМ. Комбинированное лечение тяжелых форм псориаза. *Российский журнал кожных и венерических болезней.* 2013;16(1):34-36. doi: 10.17816/dv36779.
15. Охлопков ВА, Правдина ОВ, Мельниченко ДС, Полещук ЕИ, Репина ТВ. Клиническая оценка комбинированной иммуносупрессивной терапии псориаза. *Клиническая дерматология и венерология.* 2017;16(3): 64-69. doi: 10.17116/klinderma201716364-69.
16. Singh SK, Singnarpi SR. Safety and Efficacy of Methotrexate (0.3 mg/kg/week) versus a Combination of Methotrexate (0.15 mg/kg/week) with Cyclosporine (2.5 mg/kg/day) in Chronic Plaque Psoriasis: A Randomised Non-Blinded Controlled Trial. *Indian J Dermatol Venereol Leprol.* 2021;87(2):214-222. doi: 10.25259/IJDVL_613_19.
17. Олисова ОЮ, Гаранян ЛГ. Эпидемиология, этиопатогенез и коморбидность при псориазе – новые факты. *Российский журнал кожных и венерических болезней.* 2017;20(4):214-219. doi: 10.18821/1560-9588-2017-20-4-214-219.
18. Кунгуров НВ, Кениксфест ЮВ, Гришаева ЕВ, Кохан ММ. Клинический опыт применения препарата иксекизумаб в терапии пациентки с тяжелым псориазом и псориатическим артритом, резистентными к терапии. *Лечащий врач.* 2020;5:42-47. doi: 10.26295/OS.2020.20.45.008.
19. Кубасов АА. Псориаз - не приговор. М.: КнигИздат; 2022.
20. Сердюкова ЕА, Цой АЯ. Эффективность терапии этанерцептом у пациентов с тяжелыми формами псориаза: клинические наблюдения. *Клиническая дерматология и венерология.* 2020;19(1): 75-81. doi: 10.17116/klinderma20201901175.
21. Короткий НГ, Кубылинский АА, Тихомиров АА, Уджуху ВЮ, Шарова НМ. Новые высокоэффективные препараты в лечении псо-

Almanah klinicheskoj mediciny. 2021;49(8):525-532. doi: 10.18786/2072-0505-2021-49-068. [in Russian]
4. Turbovskaya SN, Kotenko KV. Lokalnaya uzkopolosnaya (311 nm) fototerapiya ladonno-podoshvennogo psoriaza u detej. *Fizioterapiya, balneologiya i reabilitaciya.* 2016;15(6):308-310. doi: 10.18821/1681-3456-2016-15-6-308-310. [in Russian]
5. Plieva KT, Dvoryankova EV, Denisova EV, Korsunskaya IM. Fotodinamicheskaya terapiya v kompleksnom lechenii bolnyh psoriazom. *Klinicheskaya dermatologiya i venerologiya.* 2017;16(6): 110-114. doi: 10.17116/klinderma2017166110-114. [in Russian]
6. Murashkin NN, Ambarchyan ET, Epishev RV, Materikin AI, Opryatin LA, Ivanov RA, Kukoleva DS, Pomazanova MYu, Kupcova DG, Kozyr YaV, Bakulev AL. Effektivnost i bezopasnost ustekinumaba u detej s blyashechnoj, eritrodermicheskoj i ladonnopodoshvennoj formami psoriaza: retrospektivnoe kogortnoe issledovanie. *Voprosy sovremennoj pediatrii.* 2020;19(6):531–537. doi: 10.15690/vsp.v19i6.2153. [in Russian]
7. Buauish R. Primenenie neotigazona u detej v lechenii ladonno-podoshvennogo psoriaza. *Bulletin of Medical Internet Conferences. 2017;7(5):700.* [in Russian]
8. Hismatullina ZR, Koreshkova KM, Yulamanov AS. Opyt primeneniya preparata netakimaba v lechenii bolnyh psoriazom i psoriaticheskim artritom. *Klinicheskaya dermatologiya i venerologiya.* 2021;20(6):72-80. doi: 10.17116/klinderma20212006172. [in Russian]
9. Kubylinskij AA, Korotkij NG, Tihomirov AA, Udzhuhu VYu, Sharova NM. Ocenka effektivnosti i bezopasnosti primeneniya otechestvennogo selektivnogo immunosupressora v terapii bolnyh psoriazom. *Klinicheskaya dermatologiya i venerologiya.* 2014;5:68-74. [in Russian]
10. Pavlova TG, Egoshina IG. Opyt primeneniya sekukinumaba u pacienta s ladonno-podoshvennym psoriazom tyazhelogo techeniya. *Klinicheskaya dermatologiya i venerologiya.* 2018;17(5):128-132. doi: klinderma 201817051128. [in Russian]
11. Matushevskaya EV, Svirshevskaya EV, Matushevskaya YuI. Voprosy bezopasnosti i effektivnosti terapii psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2014;2:4-9. [in Russian]
12. Togoeva LSh, Minnibaev MT, Lukyanova EN, Korsunskaya IM.. Opyt lecheniya ladonno-podoshvennogo psoriaza. *Vestnik dermatologii i venerologii.* 2011;1:91-95. [in Russian]
13. Sarsur Shadi HR, Rudneva NS. Vozmozhnosti biologicheskoj terapii pri psoriaze. *Vestnik SurGU. Medicina.* 2022;54(4):13-20. doi: 10.34822/2304-9448-2022-4-13-20. [in Russian]
14. Kruglova LS, Sharapova EN, Zhukova OV, Babushkin AM. Kombinirovannoe lechenie tyazhelyh form psoriaza. *Rossijskij zhurnal kozhnyh i venericheskih boleznej.* 2013;16(1):34-36. doi: 10.17816/dv36779. [in Russian]
15. Ohlopkov VA, Pravdina OV, Melnichenko DS, Poleshuk EI, Repina TV. Klinicheskaya ocenka kombinirovannoj immunosupressivnoj terapii psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2017;16(3): 64-69. doi: 10.17116/klinderma201716364-69. [in Russian]
16. Singh SK, Singnarpi SR. Safety and Efficacy of Methotrexate (0.3 mg/kg/week) versus a Combination of Methotrexate (0.15 mg/kg/week) with Cyclosporine (2.5 mg/kg/day) in Chronic Plaque Psoriasis: A Randomised Non-Blinded Controlled Trial. *Indian J Dermatol Venereol Leprol.* 2021;87(2):214-222. doi: 10.25259/IJDVL_613_19.
17. Olisova OYu, Garanyan LG. Epidemiologiya, etiopatogenez i komorbidnost pri psoriaze – novye fakty. *Rossijskij zhurnal kozhnyh i venericheskih boleznej.* 2017;20(4):214-219. doi: 10.18821/1560-9588-2017-20-4-214-219. [in Russian]
18. Kungurov NV, Keniksfest YuV, Grishaeva EV, Kohan MM. Klinicheskij opyt primeneniya preparata iksekizumab v terapii pacientki s tyazhelym psoriazom i psoriaticheskim artritom, rezistentnymi k terapii. *Lechashij vrach.* 2020;5:42-47. doi: 10.26295/OS.2020.20.45.008. [in Russian]
19. Kubasov AA. Psoriaz - ne prigovor. M.: KniglzdatI; 2022. [in Russian]
20. Serdyukova EA, Coj AYa. Effektivnost terapii etanerceptom u pacientov s tyazhelymi formami psoriaza: klinicheskie nablyudeniya. *Klinicheskaya dermatologiya i venerologiya.* 2020;19(1): 75-81. doi: 10.17116/klinderma20201901175. [in Russian]
21. Korotkij NG, Kubylinskij AA, Tihomirov AA, Udzhuhu VYu, Sharova NM. Novye vysokoeffektivnye preparaty v lechenii psoriaza.

риаза. *Клиническая дерматология и венерология*. 2014;12(3): 77-8.
22. Круглова ЛС, Мордовцева ВВ, Жукова ОВ, Серов ДН. Комбинация кальципотриола и бетаметазона в лечении псориаза. *Клиническая дерматология и венерология.* 2014;12(6): 54-63.
23. Жукова ОВ, Круглова ЛС, Шарапова ЕН. Сочетанная ультрафиолетовая терапия и метотрексат в лечении больных тяжелыми формами псориаза. *Клиническая дерматология и венерология.* 2015;14(2): 66-73. doi: 10.17116/klinderma201514266-72.
24. Шортанбаева ЖА, Альменова ЛТ, Бейсебаева УТ, Хабижанов АБ, Абилхайыр АШ, Бабазаде НБ, Халмирзаева УП. Псориатическая болезнь: этиология, патогенез, течение на современном этапе. *Вестник КазНМУ.* 2017;4:484-486.
25. Gordon KB, Strober B, Lebwohl M, et al. Efficacy and Safety of Risankizumab in Moderate-to-Severe Plaque Psoriasis (UltIMMa-1 and UltIMMa-2): Results from Two Double-Blind, Randomised, Placebo-Controlled and Ustekinumab-Controlled Phase 3 Trials. *Lancet*. 2018;392(10148):650-651. doi: 10.1016/S0140-6736(18)31713-6.
26. Paul C, Griffiths ChEM, Van de Kerkhof PCM, et al. Ixekizumab Provides Superior Efficacy Compared with Ustekinumab over 52 Weeks of Treatment: Results from IXORA-S, a Phase 3 Study. *J Am Acad Dermatol.* 2019;80(1):70–79.e3. doi: 10.1016/j.jaad.2018.06.039.
27. Puig L, Lebwohl M, Bachelez H, Sobell J, Jacobson AA. Long-Term Efficacy and Safety of Brodalumab in the Treatment of Psoriasis: 120-Week Results from the Randomized, Double-Blind, Placeboand Active Comparator-Controlled Phase 3 AMAGINE-2 Trial. *J Am Acad Dermatol.* 2020;82(2):352–359. doi: 10.1016/j.jaad.2019.05.095.
28 Третьякова НН. Дифференциальная диагностика терапии ладонно-подошвенных форм псориаза. *Клиническая дерматология и венерология.* 2010;5:113-116.
29. Бахлыкова ЕА, Филимонкова НН, Матусевич СЛ, Котельникова АБ, Ковкова ГЮ. Пустулезный псориаз: качество жизни пациентов и методы терапии. *Практическая медицина.* 2014:8(14):27-30.
30. Романова АН, Спирина АР. Особенности псориаза и его отдельный клинический случай. *The scientific heritage*. 2021;72(2):45-49.
31. Потекаев НН, Фомина ЕС, Бобров МА. Ограниченный акральный (ладонно-подошвенный) гипокератоз. *Клиническая дерматология и венерология.* 2022;21(2):179-182. doi: 10.17116/klinderma202221021179.
32. Исаева ДР, Халдин АА. К вопросу о дифференциальной диагностике гиперкератотических дерматозов ладонно-подошвенной локализации. *Клиническая дерматология и венерология.* 2016;15(6):120-126. doi: 10.17116/klinderma2016156120-126.
33. Бусько ТМ, Козырева ОО. Применение эксимерной лампы XeCl у пациентов с различными формами псориаза. *Смоленский государственный медицинский университет.* 2016;1:41-44.
34. Хлебникова АН, Молочков АВ. Возможности липосомальной косметики в терапии псориаза. *Российский журнал кожных и венерических болезней.* 2015;18(2):31-34. doi: doi:10.17816/dv36954.
35. Львов АН, Круглова ЛС, Переверзина НО, Коленько НГ, Петрунин ДД. Противовоспалительный эффект комбинации кальципотриола и бетаметазона дипропионата. *Клиническая дерматология и венерология.* 2022;21(4):516–524. doi: 10.17116/klinderma202221041516.
36. Bou-Dargham MJ, Khamis ZI, Cognetta AB, Sang QA. The role of Interleukin-1 in inflammatory and malignant human skin diseases and the rationale for targeting Interleukin-1 alpha. *Med Res Rev.* 2017;37(1):180-216. doi: 10.1002/med.21406.
37. Белоусова ТА, Горячкина МВ. Хронические воспалительные дерматозы ладонно-подошвенной локализации. *Русский медицинский журнал.* 2013;8:393.
38. Здзитовецкая НД, Карачева ЮВ, Окладникова ЕВ, Симакова НА. Современный взгляд на лечение среднетяжелых и тяжелых форм псориаза. *Клиническая дерматология и венерология.* 2023.22.4.434-440. doi: 10.17116/klinderma202322041434.
39. Новикова ЛА, Донцова ЕВ, Бахметьев АА. Оценка эффективности нетакимаба при лечении псориаза. *Эффективная фармакотерапия.* 2022;18(31):28–32.

Klinicheskaya dermatologiya i venerologiya. 2014;12(3): 77-8. [in Russian]
22. Kruglova LS, Mordovceva VV, Zhukova OV, Serov DN. Kombinaciya kalcipotriola i betametazona v lechenii psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2014;12(6): 54-63. [in Russian]
23. Zhukova OV, Kruglova LS, Sharapova EN. Sochetannaya ultrafioletovaya terapiya i metotreksat v lechenii bolnyh tyazhelymi formami psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2015;14(2): 66-73. doi: 10.17116/klinderma201514266-72. [in Russian]
24. Shortanbaeva ZhA, Almenova LT, Bejsebaeva UT, Habizhanov AB, Abilhajyr ASh, Babazade NB, Halmirzaeva UP. Psoriaticheskaya bolezn: etiologiya, patogenez, techenie na sovremennom etape. *Vestnik KazNMU.* 2017;4:484-486. [in Russian]
25. Gordon KB, Strober B, Lebwohl M, et al. Efficacy and Safety of Risankizumab in Moderate-to-Severe Plaque Psoriasis (UltIMMa-1 and UltIMMa-2): Results from Two Double-Blind, Randomised, Placebo-Controlled and Ustekinumab-Controlled Phase 3 Trials. *Lancet*. 2018;392(10148):650-651. doi: 10.1016/S0140-6736(18)31713-6.
26. Paul C, Griffiths ChEM, Van de Kerkhof PCM, et al. Ixekizumab Provides Superior Efficacy Compared with Ustekinumab over 52 Weeks of Treatment: Results from IXORA-S, a Phase 3 Study. *J Am Acad Dermatol.* 2019;80(1):70–79.e3. doi: 10.1016/j.jaad.2018.06.039.
27. Puig L, Lebwohl M, Bachelez H, Sobell J, Jacobson AA. Long-Term Efficacy and Safety of Brodalumab in the Treatment of Psoriasis: 120-Week Results from the Randomized, Double-Blind, Placeboand Active Comparator-Controlled Phase 3 AMAGINE-2 Trial. *J Am Acad Dermatol.* 2020;82(2):352–359. doi: 10.1016/j.jaad.2019.05.095.
28. Tretyakova NN. Differencialnaya diagnostika terapii ladonno-podoshvennyh form psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2010;5:113-116. [in Russian]
29. Bahlykova EA, Filimonkova NN, Matusevich SL, Kotelnikova AB, Kovkova GYu. Pustuleznyj psoriaz: kachestvo zhizni pacientov i metody terapii. *Prakticheskaya medicina.* 2014:8(14):27-30. [in Russian]
30. Romanova AN, Spirina AR. Osobennosti psoriaza i ego otdelnyj klinicheskij sluchaj. *The scientific heritage.* 2021;72(2):45-49. [in Russian]
31. Potekaev NN, Fomina ES, Bobrov MA. Ogranichennyj akralnyj (ladonno-podoshvennyj) gipokeratoz. *Klinicheskaya dermatologiya i venerologiya.* 2022;21(2):179-182. doi: 10.17116/klinderma202221021179. [in Russian]
32. Isaeva DR, Haldin AA. K voprosu o differencialnoj diagnostike giperkeratoticheskih dermatozov ladonno-podoshvennoj lokalizacii. *Klinicheskaya dermatologiya i venerologiya.* 2016;15(6):120-126. doi: 10.17116/klinderma2016156120-126. [in Russian]
33. Busko TM, Kozyreva OO. Primenenie eksimernoj lampy XeCl u pacientov s razlichnymi formami psoriaza. *Smolenskij gosudarstvennyj medicinskij universitet.* 2016;1:41-44. [in Russian]
34. Hlebnikova AN, Molochkov AV. Vozmozhnosti liposomalnoj kosmetiki v terapii psoriaza. *Rossijskij zhurnal kozhnyh i venericheskih boleznej.* 2015;18(2):31-34. doi:10.17816/dv36954. [in Russian]
35. Lvov AN, Kruglova LS, Pereverzina NO, Kolenko NG, Petrunin DD. Protivovospalitelnyj effekt kombinacii kalcipotriola i betametazona dipropionata. *Klinicheskaya dermatologiya i venerologiya.* 2022;21(4):516–524. doi: 10.17116/klinderma202221041516. [in Russian]
36. Bou-Dargham MJ, Khamis ZI, Cognetta AB, Sang QA. The role of Interleukin-1 in inflammatory and malignant human skin diseases and the rationale for targeting Interleukin-1 alpha. *Med Res Rev.* 2017;37(1):180-216. doi: 10.1002/med.21406.
37. Belousova TA, Goryachkina MV. Hronicheskie vospalitelnye dermatozy ladonno-podoshvennoj lokalizacii. *Russkij medicinskij zhurnal.* 2013;8:393. [in Russian]
38. Zdzitoveckaya ND, Karacheva YuV, Okladnikova EV, Simakova NA. Sovremennyj vzglyad na lechenie srednetyazhelyh i tyazhelyh form psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2023.22.4.434-440. doi: 10.17116/klinderma202322041434. [in Russian]

doi: 10.33978/2307-3586-2022-18-31-28-32
40. Саввина НА, Слепцова НП, Стешенко ИГ. Опыт применения отечественного ингибитора IL-17A (anti-IL-17A) в терапии среднетяжелого псориаза. *Клиническая дерматология и венерология.* 2020;19(5):739-748. doi: 10.17116/klinderma202019051739.
41. Кубанов АА, Богданова ЕВ. Организация и результаты оказания медицинской помощи по профилю «дерматовенерология» в Российской Федерации. Итоги 2018 года. *Вестник дерматологии и венерологии*. 2019;4:8-23. doi: 10.25208/0042-4609-2019-95-4-8-23.
42. Хайрутдинов ВР, Белоусова ИЭ, Самцов АВ. Иммунный патогенез псориаза. *Вестник дерматологии и венерологии.* 2016;4:20-26. doi: 0.25208/0042-4609-2016-92-4-20-26.
43. Лыкова СГ, Немчанинова ОБ, Павлова ТГ, Позднякова ОН, Свечникова ЕВ. Особенности методического подхода при разработке лечебно-профилактических мероприятий по оптимизации питания и отдельных составляющих образа жизни больных псориазом. *Клиническая дерматология и венерология.* 2018;17(2):108-113. doi: 10.17116/klinderma2018172108-113.
44. Суханов БП, Керимова МГ, Елизарова ЕВ. Актуальные аспекты надзора за диетическим лечебным и профилактическим питанием в медицинских организациях. *Вопросы питания.* 2014;83(1):12-19. doi: 10.24411/0042-8833-2014-00002.
39. Novikova LA, Doncova EV, Bahmetev AA. Ocenka effektivnosti netakimaba pri lechenii psoriaza. *Effektivnaya farmakoterapiya.* 2022;18(31):28–32. doi: 10.33978/2307-3586-2022-18-31-28-32. [in Russian]
40. Savvina NA, Slepcova NP, Steshenko IG. Opyt primeneniya otechestvennogo ingibitora IL-17A (anti-IL-17A) v terapii srednetyazhelogo psoriaza. *Klinicheskaya dermatologiya i venerologiya.* 2020;19(5):739-748. doi: 10.17116/klinderma202019051739. [in Russian]
41. Kubanov AA, Bogdanova EV. Organizaciya i rezultaty okazaniya medicinskoj pomoshi po profilyu «dermatovenerologiya» v Rossijskoj Federacii. Itogi 2018 goda. *Vestnik dermatologii i venerologii.* 2019;4:8-23. doi: 10.25208/0042-4609-2019-95-4-8-23. [in Russian]
42. Hajrutdinov VR, Belousova IE, Samcov AV. Immunnyj patogenez psoriaza. Vestnik dermatologii i venerologii. 2016;4:20-26. doi: 0.25208/0042-4609-2016-92-4-20-26. [in Russian]
43. Lykova SG, Nemchaninova OB, Pavlova TG, Pozdnyakova ON, Svechnikova EV. Osobennosti metodicheskogo podhoda pri razrabotke lechebno-profilakticheskih meropriyatij po optimizacii pitaniya i otdelnyh sostavlyayushih obraza zhizni bolnyh psoriazom. *Klinicheskaya dermatologiya i venerologiya.* 2018;17(2):108-113. doi: 10.17116/klinderma2018172108-113. [in Russian]
44. Suhanov BP, Kerimova MG, Elizarova EV. Aktualnye aspekty nadzora za dieticheskim lechebnym i profilakticheskim pitaniem v medicinskih organizaciyah. *Voprosy pitaniya.* 2014;83(1):12-19. doi: 10.24411/0042-8833-2014-00002. [in Russian]